Complete Summary

GUIDELINE TITLE

Aortic aneurysm and dissection.

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Aortic aneurysm and dissection. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2007 Dec 14 [Various].

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Finnish Medical Society Duodecim. Aortic aneurysm and dissection. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2004 Feb 26 [Various].

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SCOPE

DISEASE/CONDITION(S)

- Abdominal aortic aneurysm
- Thoracic aortic aneurysm
- Aortic dissection

GUIDELINE CATEGORY

Diagnosis
Evaluation

Management
Screening
Treatment

CLINICAL SPECIALTY

Cardiology
Critical Care
Emergency Medicine
Family Practice
Geriatrics
Internal Medicine
Radiology
Surgery
Thoracic Surgery

INTENDED USERS

Health Care Providers
Physicians

GUIDELINE OBJECTIVE(S)

Evidence-Based Medicine Guidelines collect, summarize, and update the core clinical knowledge essential in general practice. The guidelines also describe the scientific evidence underlying the given recommendations.

TARGET POPULATION

- Patients with suspected or known aortic aneurysm or aortic dissection – *diagnosis and treatment*
- Individuals at risk for abdominal aortic aneurysm (i.e., age over 65 years, male sex, smoking and family history of the disease [particularly elderly brother of patients with known aneurysms] - *screening*

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation/Screening

1. Physical examination
2. Evaluation of signs and symptoms
3. Chest or abdominal x-ray
4. Ultrasonography
5. Screening for aortic aneurysm based on risk factors
6. Electrocardiogram
7. Transesophageal echocardiography
8. Computed tomography
9. Magnetic resonance imaging
10. Angiography

Treatment/Management

1. Monitoring of aneurysm diameter with ultrasonography
2. Surgery
3. Blood pressure and heart rate control: nifedipine, nitroprusside, beta-blockers
4. Analgesia

MAJOR OUTCOMES CONSIDERED

- Incidence of aortic rupture
- Mortality

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence reviewed was collected from the Cochrane database of systematic reviews and the Database of Abstracts of Reviews of Effectiveness (DARE). In addition, the Cochrane Library and medical journals were searched specifically for original publications.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Classification of the Quality of Evidence

Code	Quality of Evidence	Definition
A	**High**	Further research is very unlikely to change our confidence in the estimate of effect. • Several high-quality studies with consistent results • In special cases: one large, high-quality multi-centre trial
B	**Moderate**	Further research is likely to have an important impact on

Code	Quality of Evidence	Definition
		confidence in the estimate of effect and may change the estimate. • One high-quality study • Several studies with some limitations
C	**Low**	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate. • One or more studies with severe limitations
D	**Very Low**	Any estimate of effect is very uncertain. • Expert opinion • No direct research evidence • One or more studies with very severe limitations

GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group 2007 (modified by the EBM Guidelines Editorial Team).

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The levels of evidence [A-D] supporting the recommendations are defined at the end of the "Major Recommendations" field.

Basic Rules

- Diagnose aortic aneurysm before rupture: nearly all aneurysms can be treated surgically. Monitor a small aneurysm, found incidentally or through screening, until it reaches a size where the benefit of surgical repair outweighs the risks associated with such surgery.
- It is easy for a general practitioner to learn the diagnosis of abdominal aortic aneurysm with ultrasonography.
- Remember the possibility of aortic dissection in a patient with severe pain suggestive of acute myocardial infarction (AMI) but without clear electrocardiogram (ECG) findings.
- Patients with aortic dissection must be referred to a hospital immediately.

Aortic Aneurysms

Abdominal Aortic Aneurysm

- Atherosclerosis is the most important causative factor.
- 85% of the patients are men. An aneurysm is found in 10% of men aged 75 years or more.
- A palpable, pulsating mass in the upper or middle abdominal region is a typical finding. Most aneurysms are found accidentally.
- The patient may complain of pain which may resemble pain originating from the ureter or spinal cord. The pain often radiates to the back. Pain indicates an expanding aneurysm that needs surgery.
- Sometimes a calcified aneurysm can be recognised on plain abdominal x-rays or urography films.
- The diagnosis is confirmed by ultrasonography (which can be performed by a general practitioner familiar with the examination).
- Treatment
    - Hypertension and other cardiovascular risk factors should be treated effectively.
    - An aneurysm with a diameter of over 3 cm is **monitored with ultrasonography** every 12 months. When the diameter of the aneurysm has reached 5 cm in a man or 4.5 cm in a woman the ultrasonographic checks are carried out every 6 months (Powell & Greenhalgh, 2003).

    - **Surgery** is indicated when the diameter of the aneurysm exceeds 5.5 cm (The UK Small Aneurysm Trial Participants, 1998; Ballard, Fowkes, & Powell, 1999; Lederle et al., 2007) [**B**].
        - About 1% of aneurysms with diameter of 4 cm rupture annually compared with 10% of aneurysms with a diameter of 6 cm or more. The mortality from a ruptured aneurysm is 90%.
        - The operation may be performed by conventional open surgery with implantation of a vascular prosthetic graft, or by endovascular stenting.
    - Aneurysms extending into the chest cavity should be operated on.
- Screening for abdominal aortic aneurysms is worthwhile, at least if certain criteria related to age and risk are applied (Kent et al., 2004): these include age over 65 years, male sex, smoking and family history of the disease. Elderly brothers of patients with known aneurysms should be screened with ultrasonography (Salo et al., 1999) [**C**].
- Recommendations for even more active screening have been published because screening has been proven to decrease mortality (Cosford & Leng, 2007; Fleming et al., 2005; Earnshaw et al., 2004; Kent et al., 2004; Ashton et al., 2002; Takagi et al., 2007) [**A**]. A prerequisite for the decrease is low operative mortality (Greenhalgh & Powell, 2007).

Aneurysm of the Thoracic Aorta

- Usually asymptomatic. Pain suggests expansion.
- Aortic regurgitation (with symptoms related to it) (See the Finnish Medical Society Duodecim guideline "The Most Common Acquired Adult Valvular Heart Diseases and Associated Murmurs.")
- Tracheal or bronchial compression or phrenic nerve paralysis.
- Sometimes the neck veins are dilated due to the compression caused by the aneurysm.
- May be visible as an incidental finding on a chest x-ray.
- Treatment is either surgical or conservative.

Aortic Dissection

- The typical locations are the ascending (type I and II) and descending thoracic aorta (type III). Type I is confined to the ascending aorta. Dissections of the other types may extend into the abdominal aorta.
- As the tunica interna ruptures, the blood rushes into the layers of the tunica media. The aorta is often (but not always) dilated and may be visible on a chest x-ray.
- Marfan's syndrome is often associated with dissection or annuloaortic ectasia and aortic regurgitation.
- The incidence of aortic dissection is about 10/million inhabitants/year.

Symptoms

- **Suspect aortic dissection** in a patient with sudden excruciating pain without ECG findings suggestive of AMI.
- The patient is usually a hypertensive male.
- The location of the pain may change as the dissection advances.

- The pain radiates in the same way as pain associated with AMI, including the jaw and sometimes the palate. Pain is often also felt in the back.
- The associated symptoms include those resulting from the occlusion of aortic branches, i.e., ischaemic symptoms of the brain, heart, kidneys, and intestines.
- Acute aortic regurgitation may occur (a new murmur).

Findings

- Even though pulse asymmetry is presented only in a minority of patients it is worth checking for. A murmur from aortic regurgitation or bruits may be heard.
- Blood pressure is high, particularly in distal dissection.
- ECG will not be indicative of AMI but may show left ventricular hypertrophy, an old infarction, or ischaemia (AMI is sometimes possible when the dissection occludes a coronary artery).
- A chest x-ray may show a dilated aortic arch, but often the x-ray is nearly normal.
- Transoesophageal echocardiography is a good primary investigation. Computed tomography, magnetic resonance imaging (MRI), or angiography is often needed for final diagnosis.

Treatment

- The systolic blood pressure should be lowered quickly to around 100-120 mmHg. First aid treatment includes nifedipine 10 mg chewed, nitrate (or nitroprusside) infusion, a beta-blocker, and effective analgesia.
- Dissection of the ascending aorta should be operated on immediately. Prognosis without surgery is very poor.
- The immediate treatment of a dissection of the descending aorta is conservative (i.e., reduction of blood pressure and heart rate).
- Thrombolysis is contraindicated.

Related Resources

Refer to the original guideline document for related evidence, including Cochrane reviews and other evidence summaries.

Definitions:

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CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Concise summaries of scientific evidence attached to the individual guidelines are the unique feature of the Evidence-Based Medicine Guidelines. The evidence summaries allow the clinician to judge how well-founded the treatment recommendations are. The type of supporting evidence is identified and graded for select recommendations (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate diagnosis and treatment of aortic aneurysm and aortic dissection

POTENTIAL HARMS

Not stated

CONTRAINDICATIONS

CONTRAINDICATIONS

Thrombolysis is contraindicated in the treatment of aortic dissection.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 Feb 26 (revised 2007 Dec 14)

GUIDELINE DEVELOPER(S)

Finnish Medical Society Duodecim - Professional Association

SOURCE(S) OF FUNDING

Finnish Medical Society Duodecim

GUIDELINE COMMITTEE

Editorial Team of EBM Guidelines

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Author: Editors

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

This guideline is included in "EBM Guidelines. Evidence-Based Medicine" available from Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on August 30, 2005. This summary was updated by ECRI Institute on September 30, 2008.

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